

**ELECTRONICS****7044****TWIN TRIODE****FOR COMPUTER APPLICATIONS****7044**
ET-F29
Page 1
12-61**DESCRIPTION AND RATING****MEDIUM MU**
9-PIN MINIATURE**HIGH PERVEANCE**
HEATER-CYCLING RATING

The 7044 is a miniature, medium-mu, twin triode designed especially for service in computer applications. The tube features high zero-bias plate current and exceptional freedom from cathode interface development. Incorporated in the 7044 is a heater-cathode construction capable of withstanding many thousand cycles of intermittent operation.

GENERAL

ELECTRICAL				MECHANICAL	
Cathode—Coated Unipotential				Mounting Position—	
	Series	Parallel		Preferred Orientation—Upright or with Plate Majors in Vertical Position	
Heater Voltage, AC or DC	12.6 = 10%	6.3 = 10%	Volts	Permissible Orientation—Any	
Heater Current	0.45	0.9	Ampères	Envelope—T-6½, Glass	
Direct Inter-electrode Capacitance*				Base—E9-1, Small Burton 9-Pin	
	Section 1		Section 2	Outline Drawing—EIA 6-3	
Grid to Plate: (g to p)	6.0	6.0	μuf	Maximum Diameter	
Input: g to (h+k)	4.8	4.8	μuf	Maximum Over-all Length	
Output: p to (h+k)	0.65	0.55	μuf	Maximum Sealed Height	
Heater to Cathode: (h to k)	6.0	6.0	μuf		
Grid to Grid: (1g to 2g)		0.1	μuf		
Plate to Plate: (1p to 2p)		1.4	μuf		

MAXIMUM RATINGS

ABSOLUTE MAXIMUM VALUES, EACH SECTION†

Plate Voltage, Average‡ 300 Volts

Peak Plate Voltage|| 600 Volts

Positive DC Grid Voltage 1.0 Volts

Negative DC Grid Voltage 100 Volts

Peak Positive Grid Voltage|| 30 Volts

Peak Negative Grid Voltage|| 300 Volts

Plate Dissipation, Each Plate, Average‡ 4.5 Watts

Total Plate Dissipation, Both Plates, Average‡ 8.0 Watts

DC Grid Current, Average‡ 5.0 Milliamperes

Peak Grid Current|| 200 Milliamperes

DC Cathode Current, Average‡ 50 Milliamperes

Peak Cathode Current|| 400 Milliamperes

Heater-Cathode Voltage

Heater Positive with Respect to Cathode ‡

DC Component 100 Volts

Total DC and Peak 200 Volts

Heater Negative with Respect to Cathode ‡

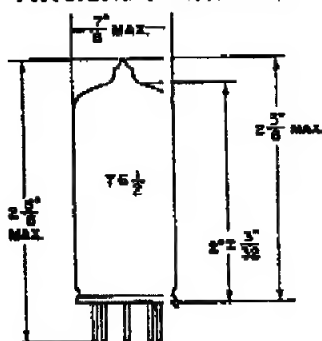
Total DC and Peak 200 Volts

Grid Circuit Resistance

With Fixed Bias 0.1 Megohms

With Cathode Bias 0.47 Megohms

Bulb Temperature at Hottest Point 160 °C

PHYSICAL DIMENSIONS

EIA 6-3

TERMINAL CONNECTIONS

Pin 1—Plate (Section 2)

Pin 2—Grid (Section 2)

Pin 3—Cathode (Section 2)

Pin 4—Heater

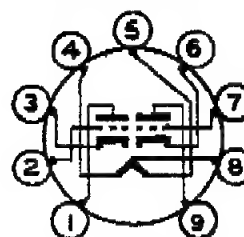
Pin 5—Heater

Pin 6—Cathode (Section 1)

Pin 7—Grid (Section 1)

Pin 8—Heater Center-Tap

Pin 9—Plate (Section 1)

BASING DIAGRAM

EIA 9H

GENERAL ELECTRIC

CHARACTERISTICS AND TYPICAL OPERATION

Average Characteristics, Each Section

Plate Voltage	90	150	120	Volts
Grid Voltage	++		-2.0	Volts
Amplification Factor			21	
Plate Resistance, approximate			1750	Ohms
Transconductance			12000	Micromhos
Plate Current	47		36	Milliamperes
Grid Voltage, approximate Ib = 200 Microamperes		-11		Volts

INITIAL CHARACTERISTICS LIMITS

	Minimum	Maximum
Heater Current Ef = 12.6 volts	410	490
Zero-Bias Plate Current, Each Section Ef = 12.6 volts, Eb = 90 volts, Ic = 250 μ a	41	62
Plate Current, Each Section Ef = 12.6 volts, Eb = 120 volts, Ec = -2 volts	26	45
Plate Current Cutoff, Each Section Ef = 12.6 volts, Eb = 150 volts, Ec = -14 volts		200
Negative Grid Current, Each Section Ef = 12.6 volts, Eb = 120 volts, Ec = -2 volts		1.5
Heater-Cathode Leakage Current Ef = 12.6 volts, Ehc = 100 volts (parallel sections) Heater Positive with Respect to Cathode		30
Heater Negative with Respect to Cathode		30
Interelectrode Leakage Resistance Ef = 12.6 volts. Polarity of applied d-c interelectrode voltage is such that no cathode emission results		
Grid (Each Section) to All at 300 volts d-c	50	
Plate (Each Section) to All at 500 volts d-c	50	

Absolute-Maximum ratings are limiting values of operating and environmental conditions applicable to any electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making no allowance for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration and of

all other electron devices in the equipment.

The equipment manufacturer should design so that initially and throughout life no absolute-maximum value for the intended service is exceeded with any tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of the tube under consideration and of all other electron devices in the equipment.

The tubes and arrangements disclosed herein may be covered by patents of General Electric Company or others. Neither the disclosure of any information herein nor the sale of tubes by General Electric Company conveys any license under patent claims covering combinations of tubes with other devices or

elements. In the absence of an express written agreement to the contrary, General Electric Company assumes no liability for patent infringement arising out of any use of the tubes with other devices or elements by any purchaser of tubes or others.

SPECIAL TESTS AND RATINGS

Heater-Cycling

2000-Cycle Life-Test Endpoint, Maximum

Heater-Cathode Leakage††. 90 Microamperes

Cathode-Interface Impedance

1000-Hour Life-Test Endpoint, Maximum¶¶. 25 Ohms

Intermittent Shorts§§

* Without external shield.

† Pulse terms in accordance with "Standards on Pulses: Definitions of Terms—Parts I and II—1951, 1952"; IRE.

‡ Averaging time 1 millisecond unless otherwise specified.

§ Measured between plate and a cathode.

¶ Rating based on a rectangular pulse of 10 μ sec width, 1% duty factor ($\approx 0.1\%$), and 1 KC repetition rate. The rise time shall be less than 1 μ sec and the fall time shall be less than 2 μ sec. Overshoot shall be less than 5% and droop shall be less than 10%.

* Not recommended for reliable operation.

** With grid current adjusted for approximately 250 microamperes.

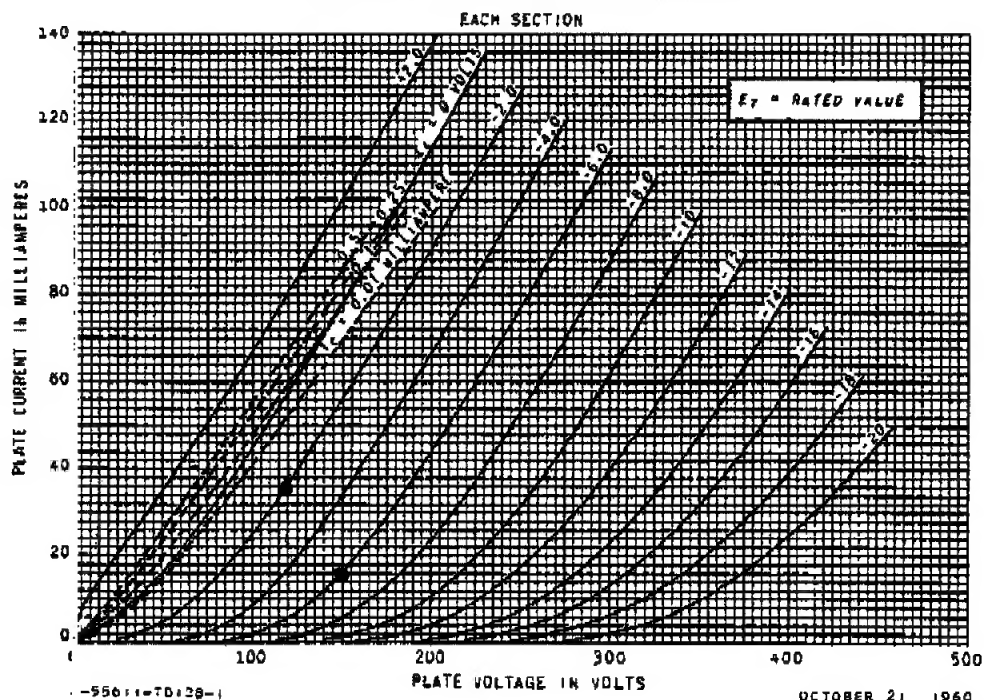
†† Statistical sample operated for 2000 cycles. Conditions of test include $E_f = 7.5$ volts (parallel heater connection), cycled for one minute on and one minute off, $E_b = E_c = 0$ volts, and $E_{hk} = 135$ volts with heater positive with respect to cathode.

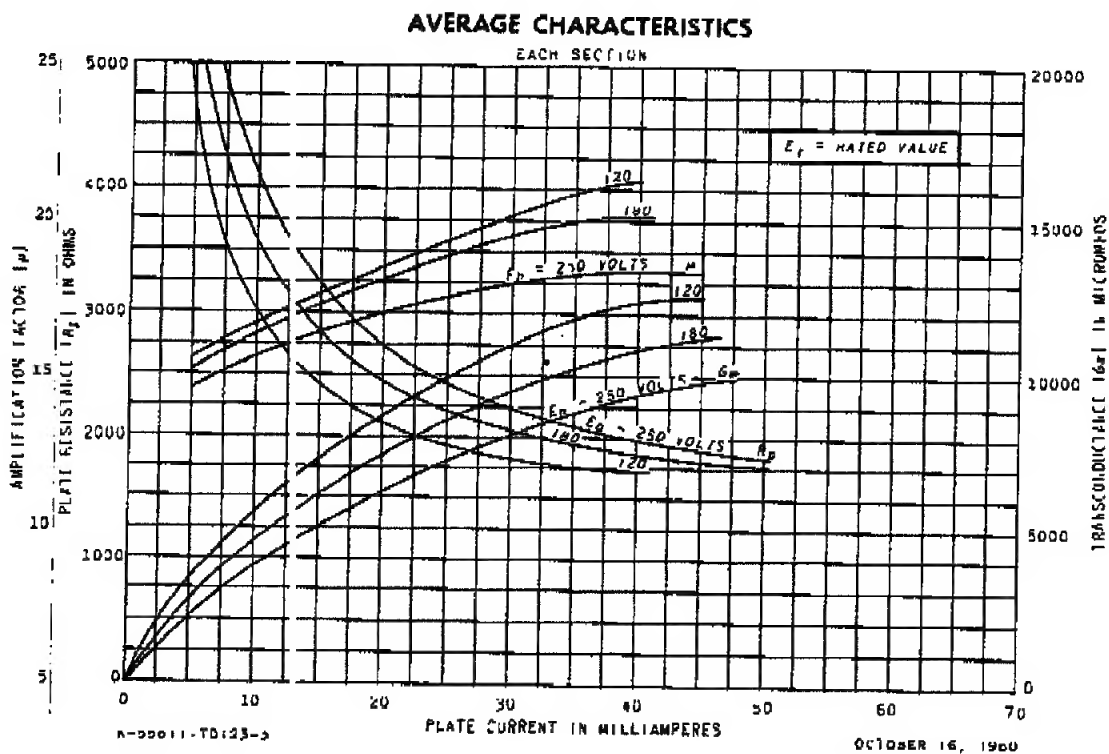
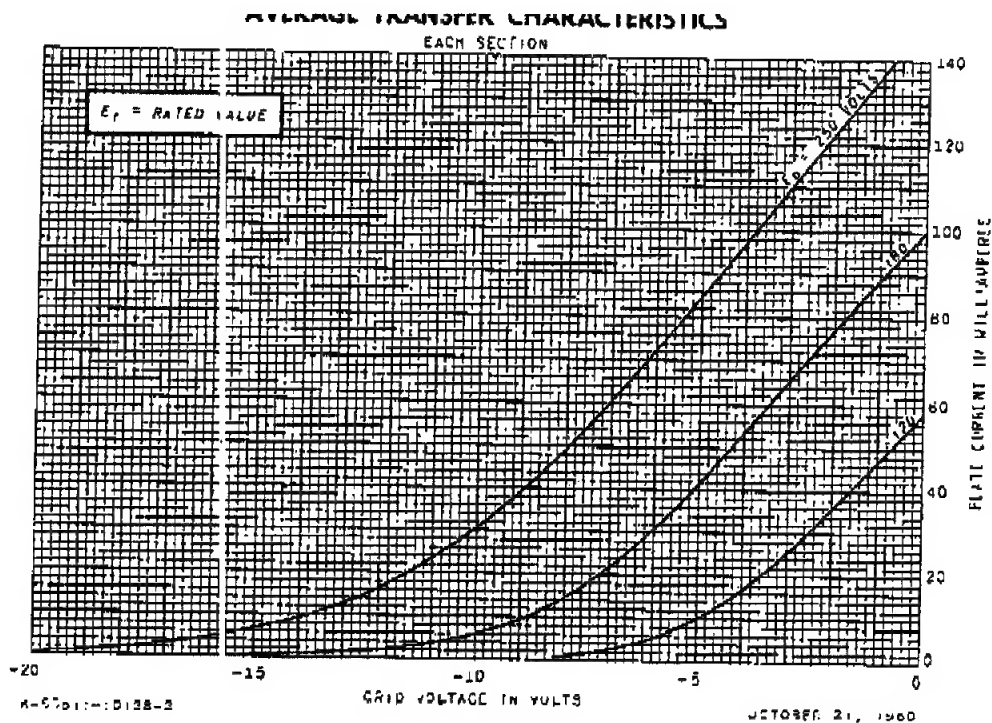
¶¶ Statistical sample operated for 1000 hours under the following conditions for each section: $E_f = 0.3$ volts, $E_b = 150$ volts, $E_{cc} = -100$ volts, $E_{hk} = -100$ volts, and $R_g = 0.1$ megohms.

§§ Intermittent shorts are measured with equipment capable of detecting resistances as follows:
less than 100,000 ohms for 15 microseconds
less than 2.5 megohms for 1 millisecond

The acceleration applied to the tube is an approximate half-sinusoid of 50 to 100 G for a base duration of approximately 500 microseconds.

AVERAGE PLATE CHARACTERISTICS





RECEIVING TUBE DEPARTMENT

GENERAL ELECTRIC

Owensboro, Kentucky